Superfund Proposed Plan

U.S. Environmental Protection Agency

Standard Chlorine Chemical Co. Inc. Superfund Site

Kearny, New Jersey

July 2016

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Standard Chlorine Chemical Co. Inc. (SCCC) Superfund Site and identifies the preferred remedial alternative along with the rationale for the preference.

The Proposed Plan was developed by the United States Environmental Protection Agency (EPA), the lead agency for the SCCC Site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA is issuing this document as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9617(a), and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The nature and extent of the contamination at the SCCC Site and the remedial alternatives summarized in this Proposed Plan are described in detail in the October 2015 Remedial Investigation (RI) Report, the January 2016 RI Addendum Report, and the July 2016 Focused Feasibility Study (FFS) Report. The RI/FFS reports and other documents are part of the publicly available administrative record file (see text box on page 22 entitled, "For Further Information"). EPA encourages the public to review these reports for a comprehensive understanding of the RI/FFS conducted at the site.

EPA's preferred alternative builds upon previously completed cleanup actions conducted at the SCCC Site with oversight by EPA and/or NJDEP. Previously completed actions include installation of a barrier wall containment system, near-shore sediment removal, dense non-aqueous phase liquid (DNAPL) recovery and groundwater removal, treatment and discharge in accordance with NJDEP permitting regulations.

MARK YOUR CALENDAR

Public Comment Period - July 27 to August 26, 2016

EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Alison Hess, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007
Fax: (212) 637-4866
Email: hess.alison@epa.gov

Public Meeting – August 16, 2016 at 7:00 PM

EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Focused Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at:

Council Chambers
Kearny Town Hall
402 Kearny Ave
Kearny, NJ 07032

EPA's website for the SCCC Site:
www.epa.gov/superfund/standard-chlorine

EPA's Proposed Plan:
https://semspub.epa.gov/src/document/02/396008

396008

The preferred alternative also considers the reasonably anticipated future land use of the SCCC Site (commercial/industrial) and the redevelopment plans for the site as warehousing and distribution facilities.

The major components of the preferred alternative are targeted cap/cover; barrier wall system; DNAPL recovery; institutional controls (ICs); demolition of five dilapidated buildings; and operation, maintenance, and monitoring (O&M). The preferred alternative (as well as the other alternatives evaluated in detail) would result in contaminants remaining on the site above levels that allow for unlimited use and unrestricted exposure; therefore, a review of the site conditions would be conducted by EPA at least once every five years, as required by CERCLA.

The total present worth cost of the preferred alternative is approximately $11,250,000.

Community Role in the Selection Process

This Proposed Plan is being issued to inform the public of EPA's preferred alternative and to solicit public comments pertaining to the remedial alternatives evaluated, including the preferred alternative. Changes to the preferred alternative, or a change from the preferred alternative to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. EPA is soliciting public comments on the alternatives considered in the Proposed Plan because EPA may select a remedy other than the preferred alternative. This Proposed Plan is available to the public for a public comment period that concludes on August 26, 2016.

A public meeting will be held during the public comment period to present the conclusions of the RI/FFS, elaborate further on the basis for identifying the preferred alternative, and receive public comments. The public meeting will include a presentation by EPA of the preferred alternative and the other evaluated alternatives. Information on the public meeting and submitting written comments can be found in the "Mark Your Calendar" text box on page 1.

Comments received at the public meeting and during the comment period will be documented in the responsiveness summary section of the Record of Decision (ROD). The ROD is the final decision document that EPA will issue after taking into consideration the public comments on the Proposed Plan. The ROD will explain the cleanup remedy that has been selected and the basis for its selection.

Scope and Role of the Action

The SCCC Site is being addressed as a single operable unit. The RI/FFS was completed for all contaminants, environmental media, and exposure pathways of concern under current site conditions.

Early response actions already taken at the SCCC Site prevent any further discharge of contaminants from the site to the adjacent Hackensack River. With respect to historic releases from the site to the Hackensack, additional investigation of the river is under consideration by EPA and NJDEP as a separate matter. EPA has released a September 2015 Preliminary Assessment of the Lower Hackensack River, Bergen and Hudson Counties (which is available online at https://www.epa.gov/nj/hackensack-river-preliminary-assessment-report) and river sampling is underway.

SITE BACKGROUND

Site Description

The SCCC Site consists of approximately 42 acres in an industrial area of the Town of Kearny, Hudson County, New Jersey. (Figure 1). It includes the 25-acre former SCCC property located at 1025-1035 Belleville Turnpike and a 13-acre portion of the adjacent Seaboard property (a New Jersey brownfields site). Together, the SCCC property and 13-acre portion of the Seaboard property are designated as Area 1 of the

SCCC Site. The site also includes 3.8 acres that consist primarily of the Belleville Turnpike, Newark Turnpike, and associated steep embankments, and which are designated Area 2 of the site. To the north of the site is the adjacent Diamond Shamrock property, which is also a New Jersey brownfields site.

The SCCC Site is relatively flat, with elevations ranging from about three to 15 feet above sea level. The surface of the SCCC property is currently either paved, covered with coarse gravel, or vegetated. Most of the buildings have been demolished and the only original structures remaining are the five dilapidated buildings associated with the Thomas A. Edison, Inc. Emark Battery Corporation (Edison).

Geology and Hydrology

Hudson County lies within the Piedmont Physiographic Province of New Jersey. It is mainly underlain by slightly folded and faulted sedimentary rocks of Triassic and Jurassic age (240 to 140 million years old) and igneous rocks of Jurassic age. At the surface, the Piedmont is a low rolling plain divided by a series of higher ridges that slope gently toward sea level in Newark Bay.

The area originally consisted of marshlands bordering the Hackensack River. In the first half of the 20th century, industrial fill materials were placed in the coastal marshlands of this region to create property for industrial/commercial development. At the SCCC Site, the industrial fill materials (fill unit) are two to 10 feet thick and include chromite ore processing residue (COPR) generated at the adjacent Diamond Shamrock property. The marsh surface below the fill unit is two to eight feet thick and consists of silt, humus, and peat (meadow mat). Beneath the meadow mat is a sand unit generally less than 10 feet thick and a continuous varved clay unit estimated at greater than 40 feet thick across the SCCC Site. Below the clay unit is glacial till and bedrock.

The fill unit and the sand unit are separate shallow groundwater bearing units. The fill unit is unconfined and the depth to ground water is typically three to four feet below existing ground surface. The meadow mat is compacted into a semi-confining unit. Decomposition of the organic matter in the meadow mat has used up the available oxygen so that it is now a chemically reducing environment. The varved clay unit has low permeability and is an effective aquitard hydraulically separating the sand unit above and the glacial till and bedrock below.

The site is located within the 100-year floodplain of the Hackensack River. Surface water runoff at the SCCC Site previously was channeled into surface ditches that emanated eastward toward the Hackensack River or into on-site lagoons. Currently, no flowing surface waters are present on the SCCC Site. A new subsurface stormwater collection piping system manages the stormwater runoff. Approximately 1.28 acres of man-made freshwater wetlands exist across the SCCC Site.

Site History

Since 1916, various forms of industrial manufacturing, chemical refining, blending/ mixing, and/or processing have occurred on the different parcels that make up the SCCC property. Activities have included naphthalene refining and product formulation, lead-acid battery manufacturing, formulation of drain cleaner, dye-carrier production, and distillation/ purification of various chlorinated benzenes. Buildings production areas, ditches, and lagoons were constructed to support these historic operations. Two lagoons (east lagoon and west lagoon) were located on the eastern portion of the site. The lagoons drained into a ditch that ran along the southern property boundary (southern ditch) and into the Hackensack River. The historical site arrangement is shown in Figure 2.

The northern portion of the SCCC Site (Block 287, Lots 48 and 49) was originally sold to the White Tar Company of New Jersey in 1916. White Tar Company was eventually acquired by the Koppers Company and successors. In 1946, Koppers acquired Lots 51, 52, and 52R from

Edison, and by 1962 sold all of its properties to Standard Naphthalene Products Company, Inc., a wholly-owned subsidiary of SCCC. Standard Naphthalene and/or SCCC continued operations on Lots 48, 49, 51, and 52 until 1981.

The southern portion (Lots 50, 51, and 52) was acquired by Edison in 1917 and 1918 and, through a number of related party transfers, was owned by Edison by 1929, and used for lead acid battery production up to 1953. Lot 50 continued to be owned by Edison until December 1953 when the property was sold to Crown Rubber Products and then to Keaton Rubber Company. For the period between 1954 and 1963, Tanatex Chemical Corporation leased space in Building 3 on Lot 50 for its operations. For some of that period it also leased space in Building 1 on Lot 50. By 1962, Lot 50 was sold to SCCC and its subsidiary Cloroben Chemical Corporation. Cloroben continued operating facilities at the site until 1993. On October 10, 2010, the Town of Kearny, New Jersey completed a tax foreclosure on Lots 48, 49, 50, 51, 52, and 52R and is now the owner of these parcels. Lot 52R, also known as 52.01, is a riparian parcel outboard of the barrier wall and is not considered part of the SCCC Site.

Lot 32.01 is approximately 25 feet wide and bisects the SCCC property in a roughly north-south direction. Lot 32.01 formerly contained working rail lines associated with the New York and Greenwood Lake Railroad and was used for transportation. Rail use was discontinued at some point, and prior to 1993, Lot 32.01 was acquired by the Hudson County Improvement Authority (HCIA). HCIA still owns this portion of the SCCC Site today. HCIA also owns the Seaboard property, and thus is the owner of the 13-acre portion of the site in Area 1.

Reasonably Anticipated Future Land Use and Site Redevelopment

The RI/FFS considered the reasonably anticipated future uses of the SCCC Site. In 2012, the Town of Kearny, which owns the majority of the SCCC Site, petitioned the New Jersey Meadowlands Commission (now the New Jersey Sports and Exposition Authority) to designate the SCCC property and adjoining properties as a redevelopment area. In 2013, the New Jersey Meadowlands Commission adopted a redevelopment plan for the area that allows for certain commercial or industrial uses and prohibits residential use. The Town of Kearny recently adopted a resolution (Resolution 2016-250) conditionally designating the Sitex Group, LLC (Sitex) as the redeveloper of the SCCC property and the adjacent Diamond Shamrock property owned by Tierra. Sitex is planning to construct an 850,000 square foot warehouse and distribution center on the SCCC property and adjacent Diamond Shamrock property. Plans for redevelopment of the Seaboard property are also underway. According to information provided by HCIA, HCIA has entered into a Purchase and Sale Agreement with Morris Kearny Associates, LLC (Morris) to develop the Seaboard property, including the 13-acre portion of the Seaboard property included within Area 1 of the SCCC Site. Morris's redevelopment plan for the Seaboard property includes the construction of four new industrial warehouse buildings totaling approximately 2.1 million square feet, along with paved parking lots, paved roads, and utility infrastructure.

Most of Area 2 consists of a New Jersey Department of Transportation (NJDOT) right-of-way for Belleville Turnpike and Newark Turnpike and is occupied by highway and associated steep embankments. It is reasonably anticipated that the future use will remain consistent with this current use.

The remedial alternatives were developed to be compatible with the commercial/industrial future uses of the SCCC Site. When practicable and cost-effective, the remedial alternative selected in the ROD would be designed to accommodate the commercial/ industrial redevelopment plans described above for Area 1, while at the same time maintaining the environmental protectiveness provided by the remedy.

Regulatory History

In 1982, a NJDEP inspection of the SCCC property revealed the presence of chromium-contaminated fill materials, hexavalent chromium in surface waters, and spillages of naphthalene and dichlorobenzene on the ground surface. The inspection also disclosed that the lagoon system at the site was previously used for waste disposal by Koppers Company. Groundwater samples collected from a monitoring well on the Diamond Shamrock property adjacent to the SCCC property's northern border revealed contamination with naphthalene, dichlorobenzenes, and trichlorobenzenes, which NJDEP suspected to have migrated from the SCCC property. Subsequent groundwater and soil sampling undertaken by SCCC and NJDEP from 1983 until 1987 demonstrated contamination of hazardous substances throughout the site.

In October 1989, SCCC entered into an Administrative Consent Order with NJDEP to conduct a remedial investigation and perform a remedial action at the site. In April 1990, Occidental Chemical Corporation (OCC) and Chemical Land Holdings, Inc. (now Tierra Solutions, Inc.) entered into a separate Administrative Consent Order to address the COPR fill materials at the SCCC Site that were generated at the adjacent Diamond Shamrock property. NJDEP was the lead agency during these initial investigations and early response actions. In December 2001, NJDEP referred the SCCC Site to EPA for proposed inclusion on the National Priorities List (NPL). On April 30, 2003, EPA proposed adding the SCCC Site to the NPL. The SCCC Site was subsequently listed on September 19, 2007.

Enforcement History

In April 2008, EPA sent a general notice letter to SCCC, OCC, Beazer East, Inc. (Beazer), and Tierra Solutions, Inc. (Tierra) advising each party of its potential responsibility under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), for cleanup of the SCCC Site, including all costs incurred by EPA in responding to releases at the site. EPA sent a similar general notice letter to Cooper Industries, LLC (Cooper) in July 2009 and to Apogent Transition Corp. (Apogent) in December 2012. In July 2010, EPA contacted SCCC, Beazer, OCC, Tierra, and Cooper, inviting each party to enter into a settlement with EPA to conduct RI/FFS activities at the site. Later, EPA contacted Apogent to enter into the settlement.

The RI/FFS was conducted pursuant to the May 2013 Administrative Settlement Agreement and Order on Consent entered into between EPA and Apogent, Beazer, Cooper, and OCC. Tierra participated in the RI/FFS on behalf of OCC.

EARLY INVESTIGATIONS AND EARLY RESPONSE ACTIONS

Early Investigations (1983 to 2009)

Major investigations completed prior to the RI/FFS are listed in Table 1. These investigations included an asbestos and lead paint survey, wetlands delineation, an aerial topographic survey, waste classification requests, off-site disposal of demolition debris, numerical groundwater modeling, and sampling and analysis of vault contents.

Table 1: Pre-RI/FFS Investigations and Surveys dating back to the early 1980s		
Date	Investigation	Company
1983-1984	Hydrogeologic Investigation	Roy F. Weston, Inc.
1985	Phase II Dioxin Investigation	E.C. Jordan, Inc.
1987	Stage 1 Dioxin Investigation	Roy F. Weston, Inc.
1988	Stage 2 and 3 Dioxin Investigations	Roy F. Weston, Inc.
1991	Chromium Delineation	French & Parrello Associates
1990-1993	Remedial Investigation/Supplemental RI	Roy F. Weston, Inc.
1996-1997	Focused Remedial Investigation	ERM, Inc.
1997-1999	Supplemental Remedial Investigation	Key Environmental, Inc.
2000	Soil/Sediment Sampling and Analysis	Enviro-Sciences, Inc.
2000	Characterization of Containerized Materials	Enviro-Sciences, Inc.
2002	Surface Water and Sediment Sampling	EPA Technical Assistance Team
2008-2009	IRA Pre-Design Investigation	Key Environmental, Inc.
2008-2009	Phase II Supplemental RI	Key Environmental, Inc.

Interim Remedial Measures (1990s to 2008)

Since the early 1990s, various interim remedial measures were completed at the site with NJDEP oversight as follows:

- installation of security fencing surrounding a former production area and lagoons to prevent unauthorized access;
- addition of soil to the lagoon berm to increase its height and prevent potential overflows;
- placement of stabilizing geotextile and rip rap along the Hackensack River shoreline in the vicinity of the lagoons;
- removal of the contents of five aboveground storage tanks and repackaging of asbestos containing material removed from the former distillation building;
- installation of an asphalt pavement overlay on traffic areas where existing deteriorated asphalt pavement was present;
- installation of geotextile fabric/aggregate/ asphalt cover in all remaining traffic areas where total chromium concentrations exceeded the NJDEP criterion in effect at the time (75 milligrams per kilogram (mg/kg));
- geotextile/geomembrane liner or aggregate cover construction in non-traffic areas west of a railroad right-of-way;
- installation of a dust fence barrier along the railroad right-of-way and north fence line of the northeast process area; and,
- improvements to the existing stormwater sewer located between the SCCC Site and the Diamond Shamrock property.

Interim Response Actions and Non-Time Critical Removal Action (2009 to 2011)

Work related to the site with NJDEP as the lead agency continued through NPL listing in 2007. In 2009, EPA approved an Engineering Evaluation/ Cost Analysis (EE/CA) for a non-time critical removal action under CERCLA that corresponded with the NJDEP-approved Interim Response Action. EPA designated NJDEP as the lead agency for implementation of the EE/CA.

Remedial activities conducted pursuant to the EE/CA and the NJDEP Interim Response Action (IRA) include engineering controls and containment measures. Individual tasks especially pertinent to the RI/FFS alternatives included:

- construction of a *Barrier Wall Containment System*, a 1,230 foot long steel sheet pile wall along the Hackensack River and a 6,880 foot long barrier wall with cement bentonite slurry two feet in width that encircles Area 1 of the SCCC Site (SCCC property and 13

acres of Seaboard property) as well as the adjacent Diamond Shamrock property. The barrier wall is keyed a minimum of three feet into the varved clay, and cuts off the area inside the barrier wall from the surrounding subsurface;

- a *DNAPL Recovery System* consisting of sixteen 18-inch diameter high-density polyethylene recovery wells with 10 foot sumps within the barrier wall system; as of June 30, 2016, 6,330 gallons of DNAPL have been recovered at the SCCC Site for off-site disposal;
- a *Hydraulic Control System and Groundwater Treatment Plant (HCTS)* to maintain hydraulic containment of groundwater within the barrier wall and to treat contaminated groundwater pursuant to a New Jersey Pollutant Discharge Elimination System (NJPDES) permit, with treated effluent meeting discharge permit limits discharged to the Hackensack River;
- *Lagoon Dewatering and Solidification*; historic analytical results confirmed the lagoons as a significant source area. Lagoon solids were found to consist of 77 percent naphthalene and the remainder largely chlorinated benzenes, methylnaphthalene, phenols, 2,3,7,8-tetrachlorodibenzo-p-dioxin, arsenic, lead, and hexavalent chromium. The accumulated liquids in the former lagoons were collected and treated on-site and the solids were stabilized primarily with Portland cement and encapsulated in place;
- construction of a *Consolidation Area and Surface Cover* in the vicinity of the former lagoons. Soft soils in the south ditch were found to contain chlorinated benzenes (1,4-dichlorobenzene most frequently), naphthalene and other polycyclic aromatic hydrocarbons (PAHs), and to a lesser extent polychlorinated biphenyls (PCBs) and dioxin/furans, chromium, and lead. The south ditch soft soils were excavated, stabilized with Portland cement, and placed in the Consolidation Area. Materials generated during the barrier wall construction and nearshore river sediment impacted by chlorobenzenes, naphthalene and other PAHs, dioxins, and metals, including chromium, were removed, stabilized, and placed in the Consolidation Area. The Consolidation Area was covered with a multi-layer cover system consisting of a 60-mil linear low density polyethylene liner, geosynthetic drainage layer, structural fill, and top soil;
- treatment and disposal of *septic tank contents*; six septic tanks were sampled and analyzed to determine appropriate disposal methods and requirements. The tank solids contained benzene, various chlorobenzenes, naphthalene and other PAHs, PCBs, and several metals. Solids were removed and disposed of off-site. Liquids were removed and treated in a temporary on-site treatment facility, and discharged through the NJPDES outfall. The tanks were then filled with a flowable concrete grout; and,
- *Process Area Surface Cover and Stormwater Controls*; A liner and gravel surface cover was installed in the former process area located to the north of the former lagoons. Existing surface cover materials across the SCCC Site were repaired as needed. Stormwater conveyance piping, catch basins, and manholes were installed to convey stormwater historically carried by the south ditch. The newly installed stormwater system is approximately 2,980 feet long and extends from the northwestern corner of the SCCC Site to the Hackensack River.

CERCLA Removal Action (2010)

In June 2010, SCCC and Beazer entered into a Removal Action Order with EPA that required the sealing of openings in the former process area buildings and the maintenance, and replacement as necessary, of the existing fencing surrounding

the eastern portion of the SCCC Site and the warning signs along the fencing. These activities are summarized in the December 2010 Final Report, Closure of Building Openings, Northeastern Area, Standard Chlorine Chemical Company Superfund Site.

Classification Exception Area/Well Restriction Areas (2003 and 2013)

The site is subject to NJDEP Classification Exception Area/Well Restriction Areas (CEA/WRAs) established prior to the RI/FFS. A CEA serves as an institutional control by providing notice that the constituent groundwater standards are not or will not be met in a localized area due to natural water quality or anthropogenic influences (for example, contaminated sites), and that aquifer uses are restricted in the affected area for the duration of the CEA. In 2003, Tierra, on behalf of OCC, established a CEA/WRA that covers certain COPR sites on the Kearny Peninsula, including the SCCC property. The constituents listed in CEA/WRA for the COPR sites include total chromium, hexavalent chromium, total dissolved solids, and chloride.

In 2013, Beazer established a CEA/WRA that addresses the 13 acres of the Seaboard property included in Area 1 of the site and enclosed within the barrier wall system. The constituents of interest listed in the CEA/WRA for the Seaboard property include various volatile organic compounds, semi-volatile organic compounds, and metals.

REMEDIAL INVESTIGATION

A Site Characterization Summary Report (March 2013) and Site Characterization Summary Report Addendum (March 2014) were prepared to summarize the investigations and the early response actions that were conducted at the SCCC Site prior to the RI/FFS. These reports also identified data gaps requiring further investigation during the RI. The RI Report and RI Addendum Report combine information from the site characterization summary reports and the RI field work to characterize the SCCC Site. The current site arrangement is shown in Figure 3.

Remedial Investigation (2013-2015)

The first phase of RI field investigation focused on obtaining data necessary to evaluate the risks posed to human health and the environment and to support the evaluation of remedial alternatives in the FFS. The main data gaps included surface soil evaluation, DNAPL delineation, and continuity of the varved clay. The RI investigations confirmed that the thick and continuous varved clay unit is an effective barrier to vertical migration of dissolved phase groundwater contamination and DNAPL. The meadow mat was found to effectively mitigate and impede the downward migration of hexavalent chromium by reducing it to insoluble trivalent chromium.

Details are summarized in the March 2015 RI Report. A brief summary of the RI Report is presented below.

DNAPL

DNAPL is an immiscible fluid with a density greater than water that migrates through the subsurface and leaves behind a residual that is difficult to remediate. The DNAPL associated with naphthalene formation and other processing activities at the SCCC Site contains chlorinated benzenes, naphthalene, PCBs, and dioxins/ furans.

DNAPL in the fill unit is present in the former lagoon area and near Building 4 on Lot 50. DNAPL in the sand unit extends beyond the SCCC property onto the Diamond Shamrock property and the Seaboard property. The barrier wall system that encircles the SCCC property, the Diamond Shamrock property, and 13 acres of the Seaboard property was constructed to enclose all of the then-known SCCC Site-related DNAPL. The DNAPL is considered to be an

ongoing source of groundwater contamination in both the fill unit and the sand unit.

Surface and Subsurface Soil

Impacts to surface and subsurface soil extend across the SCCC Site due to the placement of the COPR fill and historical activities. Constituent groups detected include chlorinated benzenes, PAHs (including naphthalene), PCBs, dioxins/furans (or polychlorinated dibenzodioxin/polychlorinated dibenzofuran (PCDD/PCDF)), and metals, including lead and hexavalent chromium. Chlorinated benzenes were found in soil in both the eastern and western portions of the SCCC Site, generally near former chlorinated benzene distillation, purification, storage, and/or handling areas and the lagoons. Chlorinated benzene concentrations were generally highest in soil at depth in the sand unit due to their accumulation as DNAPL on top of the underlying varved clay.

Naphthalene and other PAHs, and to a lesser extent PCBs and PCDD/PCDF, were found in the eastern SCCC Site soil and lagoons. Naphthalene and other PAHs were also found in the western SCCC Site soil within areas of fill. The highest concentrations were associated with the lagoons and DNAPL beneath or near the former lagoons and extending west. Chromium was found in the western, eastern, and southern portions of the SCCC Site. Hexavalent chromium was found primarily within the upper 10 feet of the fill unit. Lead was found in the eastern and western portions of the SCCC Site.

Groundwater

Investigations of shallow groundwater within the fill unit found SCCC Site-related constituents in groundwater, including chlorinated benzenes, several volatile organic compounds, naphthalene and other PAHs, phenols, PCBs, and chromium. The highest concentrations of chlorinated benzenes and PAHs were found in the former lagoon area, although chlorinated benzenes were also found in the groundwater in the fill unit in the western portion of the SCCC Site near Building 2.

A similar suite of chemical constituents was found in groundwater in the sand unit, with the exception of hexavalent chromium due to the reducing influence of the overlying meadow mat, an organic rich layer that reduces hexavalent chromium to trivalent chromium. Impacts of organic constituents in the sand unit were found to be laterally extensive and vertically limited due to the underlying varved clay acting as a barrier to downward migration.

Surface Water

Historical data indicated impacts to surface water in drainage ditches from chlorinated benzenes, naphthalene and other PAHs, and total chromium. Surface water in the former lagoon representing accumulated precipitation in contact with lagoon solids contained dichlorobenzene, phenols, total chromium, and lead. The stagnant nature of surface water in the ditches appeared to have limited surface water impacts, and no significant impacts to Hackensack River surface water were identified during several historical sampling events.

Remedial Investigation Addendum (2015 to 2016)

The second phase of RI field investigation focused on Area 2 and obtaining data necessary to delineate SCCC Site-related DNAPL impacts to subsurface soils and groundwater in that portion of the site. Details are summarized in the January 2016 RI Addendum Report. A brief summary of the RI Addendum Report is presented below.

- The geologic profile within Area 2 is the same as Area 1. Surficial materials in Area 2 are comprised of (in descending order) fill unit, meadow mat, sand unit, and varved clay. The higher elevation in Area 2 is consistent with a thicker fill for NJDOT purposes. The

varved clay unit is continuous beneath Area 2.

- Area 2 is located hydraulically downgradient of Area 1. A northward component of groundwater flow south of Area 2 limits dissolved constituent migration.
- SCCC Site-related impacts in Area 2 are limited to subsurface soil and groundwater within the sand unit. The horizontal extent of SCCC Site-related impacts in the sand unit appears to end at the vegetated highway median between the westbound lane of the Belleville Turnpike and the Newark Turnpike.
- The configuration of the upper surface of the varved clay appears to have some control on the distribution of DNAPL in Area 2. DNAPL was observed in a localized broad depression in the varved clay surface. The clay surface rises slightly to the south and west, preventing further DNAPL movement. Based upon evidence from Area 1, the varved clay is an effective barrier to vertical migration of DNAPL beneath Area 2.
- Significant reductions in dichlorobenzene concentrations in subsurface soil and groundwater occur within a short distance of DNAPL impacted areas, indicating that migration of dissolved phase groundwater impacts is limited.
- A DNAPL that is believed not to be SCCC Site-related was encountered south of Area 2. This DNAPL has a different chemical signature than the DNAPL encountered at the SCCC Site, which is predominantly dichlorobenzene, and was found at a shallower depth. Investigation of this non-site-related DNAPL was beyond the scope of the RI.

Principal threat wastes are considered source materials, i.e., materials that include or contain hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water/surface water, or as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, DNAPLs in groundwater may be viewed as source material.

At the SCCC Site, principal threat wastes include the COPR fill materials and the DNAPL.

Cultural Resources

Archaeological and architectural surveys and related efforts were completed to address the possible presence of pre-European contact cultural resources and to document the historic Edison buildings, in compliance with the requirements of the National Historic Preservation Act. A summary of these reports follows:

- *Phase IA Cultural Resource Survey for the Standard Chlorine Chemical Company Site, Interim Response Action Work Plan – Town of Kearny, Hudson County, New Jersey (August 2009)* – This document was developed prior to the installation of the barrier wall to assess the presence or absence of cultural resources and the potential impacts on those resources. This report concluded that there was a low to moderate potential for deep archaeological deposits and that the activities would have only a temporary adverse effect on the historic buildings.
- *Phase IB Archaeological Survey During Slurry Wall Construction (May 2011)* – Samples were collected from the sand unit (approximately nine to 17 feet below grade) during the barrier wall construction to evaluate potential evidence of pre-contact use. Possible artifacts were recovered primarily where the barrier wall extends along the Hackensack River. A recommendation for conducting potential additional archaeological surveying was included in the report if other deep excavation activities were to be implemented.

- *Historic American Buildings Survey* (HABS) *(October 2015)* – This document provides details on the architectural aspects of the Edison buildings. It includes information on the Emark plant and the chronology of its operation. This document includes numerous photographs and copies of some original architectural drawings and meets the Secretary of the Interior's Standards for Architectural and Engineering Documentation.
- *This is the Story of Emark – A Product of Thomas A. Edison, Inc. (October 2015)* – This document is a public information bulletin to promote public understanding and appreciation of the SCCC Site's historic significance.
- *This is the Story of Emark: Learning from New Jersey History – Teacher's Guide and Lesson Plans Grade 4 (October 2015)* – This document was prepared to fulfill specific standards and goals of the New Jersey Core Curriculum Content Standards for Social Studies and Science and to foster local interest and pride.

A Memorandum of Agreement pursuant to the National Historic Preservation Act was signed in 2016 by representatives of the EPA and New Jersey State Historic Preservation Office. The Memorandum of Agreement documents the measures that have been implemented to mitigate planned adverse effects to the cultural resources (i.e., demolition of the Edison buildings). Although the buildings have historic significance, they contain asbestos and lead and are dilapidated beyond repair. EPA has determined that the Edison buildings constitute a release or threat of release of hazardous substances to the environment. The cultural resource surveys have documented the historic significance of the Edison buildings in advance of demolition.

SUMMARY OF SCCC SITE RISKS

As part of the RI/FFS, a baseline risk assessment approach was used to estimate potential current and future risks to human and ecological receptors posed by hazardous substances at the site in the absence of any actions to further control or mitigate potential exposures under existing conditions. The text box on page 12 entitled "What is Human Health Risk and How Is It Calculated?" presents information on the process EPA uses for human health risk assessments conducted under CERCLA. A similar approach is used for ecological risk assessments. Consistent with the NCP, the results of the baseline risk assessment are used to determine whether remediation is necessary and which pathways need to be remediated.

Human Health Risk Assessment

The results of the human health risk assessment are summarized in Table 2. Human exposure pathways were evaluated for constituents of potential concern identified for each medium by screening the maximum detected concentration of each analyte against the industrial EPA Regional Screening Levels that corresponded to a target cancer risk of 1×10^{-6} and a target Hazard Quotient of 0.1. Chemicals of potential concern include chlorinated benzenes, several volatile organic compounds, naphthalene and other PAHs, phenols, PCBs, and hexavalent chromium.

Under current conditions, there are no known completed exposure pathways. The interim remedial actions that have already been conducted at the site addressed the current known pathways that may result in human exposure to site contaminants.

Under future use scenarios, the cancer risks and non-cancer health hazards are above acceptable levels. The main exposure pathway is associated with disturbance of the impacted soil located beneath clean cover materials. Human receptors involved in surface or subsurface soil disturbance

are future construction or utility workers, or possibly full-time outdoor employees and on-site visitors. Exposure routes to these future receptors are inhalation of fugitive dust, and dermal contact with and incidental ingestion of impacted soil, such as potential exposures during or after site redevelopment. The baseline risk assessment requires that additional controls, such as health and safety measures and fugitive dust suppression, are assumed to be absent. Exposure to groundwater and disturbance of the cover materials and exposure to the underlying soils results in unacceptable risks to most receptors (calculated cancer risk up to 1 x 10^{-2} and non-cancer Hazard Index up to 21,189). In addition, the future construction of industrial or commercial structures without vapor mitigation systems was found to result in an unacceptable inhalation risk to future occupants due to the potential for intrusion of vapors originating from contaminants in soil and groundwater at the site. Therefore, future development, including buildings, would be expected to require the use of construction techniques to mitigate the potential for intrusion of vapors into buildings or other measures to address this pathway.

WHAT IS *HUMAN HEALTH* RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land uses. A four-step process is utilized to assess site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at a site in various media (*e.g.,* soil, surface water, and sediment) are identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and potential for bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a reasonable maximum exposure scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment*:* In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health effects.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a one-in-ten-thousand excess cancer risk; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point of departure. For non-cancer health effects, a hazard index (HI) is calculated. An HI represents the sum of the individual non-carcinogenic exposure levels compared to their corresponding reference doses. The key concept for a non-cancer HI is that a threshold level (measured as an HI of 1) exists below which non-cancer health effects are not expected to occur.

Table 2: Summary of Human Health Risk Assessment		
Receptor	**Current Land Use with Interim Remedies Disturbed**	**Future Land Use with Interim Remedies Disturbed**
	RME Risk/ HI	**RME Risk/HI**
Western Area		
On-Site Visitor	2E-4 / 4	NA
HCTS Operator	2E-4 / 4	NA
Outdoor Worker	4E-4 / 6	NA
Constr. Worker	NA	4E-4 / 21,189
Utility Worker	NA	2E-4 / 6,535
Indoor Worker(1)	NA	1E-3 / 187
Eastern Area		
On-Site Visitor	4E-3 / 17	NA
HCTS Operator	1E-2 / 37	NA
Outdoor Worker	1E-2 / 38	NA
Constr. Worker	NA	2E-2 / 3,141
Utility Worker	NA	4E-4 / 31
Indoor Worker(1)	NA	1E-3 / 147

1. Future risks to indoor workers are associated with construction of a building at the Site with no vapor barrier.

Detailed information regarding the human health risk assessment can be found in the December 2014 Baseline Human Health Risk Assessment.

Ecological Risk Assessment

The site is located in a highly industrialized area and the conceptual site model identified that, under current and future site conditions, there are no known completed exposure pathways for the potential ecological receptors identified for the SCCC Site. A Screening Level Ecological Risk Assessment was conducted, which concluded that no potentially complete exposure pathways exist. Therefore, contaminants of potential ecological concern were not identified, the ecological risks were determined to be negligible, and further baseline ecological risk assessment work was not required.

Detailed information regarding the ecological risk can be found in the September 2014 Screening Level Ecological Risk Assessment.

Risk Assessment Summary

EPA has determined that the preferred alternative identified in the Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to limit potential human health risks from actual or threatened releases of hazardous substances into the environment.

FOCUSED FEASIBILITY STUDY

The FFS is the mechanism for the identification and evaluation of remedial action alternatives. Remedial action objectives (RAOs) were developed for the Site, and then technologies were identified and screened based on overall implementability, effectiveness, and cost. Remedial alternatives consisting of one or more technologies were assembled and analyzed in detail with respect to seven of the nine criteria for remedy selection under CERCLA. The remaining two criteria, state acceptance and

community acceptance, will be addressed in the ROD following the public comment period.

Detailed information is contained in the July 2016 FFS Report. A brief summary of the FFS is presented below.

Remedial Action Objectives

RAOs describe what the proposed site cleanup is expected to accomplish. These objectives are based on available information and standards, such as Applicable or Relevant and Appropriate Requirements (ARARs), to-be-considered standards and guidance, and site-specific risk-based levels. The following RAOs were developed for the site:

- Eliminate human exposure to contaminants in surface soil and subsurface soil via direct contact, incidental ingestion, and inhalation.
- Eliminate the transport of impacted surface soil by erosion and runoff or wind.
- Prevent human exposures to site-related contaminated groundwater via direct contact, incidental ingestion, and inhalation.
- Prevent the migration of contaminated groundwater into uncontaminated groundwater, surface water, and wetlands.
- Prevent the migration of site-related DNAPL into areas without DNAPL contamination.
- Reduce the mass of site-related DNAPL in the subsurface to the extent practicable.
- Eliminate the release or threat of release of asbestos and lead into the environment from the dilapidated Edison buildings.
- Prevent future unacceptable risks due to soil vapor intrusion into new buildings.

Groundwater Restoration and Technical Impracticability Waiver

As stated in the NCP, EPA expects to restore usable groundwater to its beneficial use wherever practicable, within a timeframe that is reasonable given the particular circumstances at the site. When restoration of groundwater to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction.

The groundwater in the vicinity of the site is categorized as Class II, currently or potentially a source for drinking water. The state and federal drinking water standards (e.g., maximum contaminant levels, or MCLs) are chemical-specific ARARs for groundwater at the site.

Hydrogeologic factors, contaminant-related factors, and site-specific implementation factors were evaluated to determine the practicability of remediating the groundwater to MCLs in Area 1 and Area 2. The TI evaluation established that it is technically impracticable to remediate groundwater to drinking water standards. The COPR fill materials in Area 1 will continue to be a source of contaminants to the groundwater within the barrier wall for the foreseeable future. Hydrogeologic factors include diffusion of the DNAPL into the upper surface of the alternating clay and sand seams of the varved clay, which would pose a significant challenge to remediation. Contaminant factors include the high density and low viscosity of the DNAPL, which makes it easy to migrate extensively in the subsurface. While some portion of the DNAPL can be recovered in wells, residual DNAPL will remain trapped in subsurface voids. This residual DNAPL will dissolve slowly into the groundwater over many decades, making it technically impracticable to achieve groundwater standards in the micrograms per liter (ug/l) or part per billion range (e.g., 0.2 ug/l for benzene). The estimated timeframe for dissolution of the

site-related DNAPL is 150 years or more. Land use considerations, including the NJDOT right-of-way and steep embankments, make remediation in that part of Area 2 impracticable. The groundwater at the site is subject to existing CEA/WRAs and is not being used for any purpose. Groundwater at the site, and in the area generally, has a high naturally occurring total dissolved solids (TDS) content. Data from the sand unit in Area 1 indicates TDS contents ranging from 315 to 21,700 milligrams per liter (mg/l). Water with a TDS above 500 mg/l exceeds EPA's secondary drinking water guidelines and is not recommended for use as drinking water due to aesthetic and technical effects such as water hardness and deposits, colored water, staining, and salty taste.

For the reasons discussed above, restoration of groundwater to MCLs is not technically practicable and groundwater restoration is not an RAO for the SCCC Site.

CERCLA Section 121(d), 42 U.S.C. § 9621(d), specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

EPA intends to invoke a technical impracticability (TI) waiver in the ROD and the RAOs for the site include preventing further migration of the groundwater plume, preventing exposure to the contaminated groundwater, and further reducing risks by preventing the migration of DNAPL and preventing vapor intrusion of contaminants into new buildings which may be constructed during site redevelopment.

Detailed information on the chemical-specific groundwater standards proposed to be waived the area where the TI Waiver is sought (TI zone) as well as other technical information in support of the TI Waiver is presented in the FFS Report in Section 4.5: Justification of TI Waiver and Appendix A: Technical Impracticability Waiver Evaluation Report. The ARARs to be waived are listed in Table 3-1 of Appendix A.

Remedial Alternatives

CERCLA Section 121(b)(1), 42 U.S.C. § 9621 (b)(1), mandates that remedial actions be protective of human health and the environment, be cost effective, and use permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which use, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. As noted above, CERCLA Section 121(d), 42 U.S.C. § 9621(d), specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Remedial alternatives for the site are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. O&M costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of

the remedy with the responsible parties, or procure contracts for design and construction.

Remedial Alternatives	
Alternative	**Description**
I	No Action
II	DNAPL Recovery, Barrier Wall, ICs, Building Demolition
III	Targeted Cap/Cover, DNAPL Recovery, Barrier Wall, ICs, Building Demolition
IV	Site-wide Engineered Cap/Cover, DNAPL Recovery, Barrier Wall, ICs, Building Demolition

Alternative I: NO ACTION

Capital Cost	$0
Annual O&M Cost	$0
Present Worth Cost	$0
Construction Time	0 months

The No Action alternative is required by the NCP as a baseline with which to compare other remedial action alternatives. Alternative I is not protective of human health and the environment because it does not meet any of the RAOs.

Alternative II: CONTINUED DNAPL RECOVERY IN AREA 1, BARRIER WALL SYSTEM, DNAPL RECOVERY IN AREA 2, INSTITUTIONAL CONTROLS, AND BUILDING DEMOLITION

Capital Cost	$1,392,000
Annual O&M Cost	$541,000
Present Worth Cost	$9,759,000
Construction Time	3 months

This alternative would include the barrier wall system and continued DNAPL recovery in Area 1, construction of a new DNAPL recovery system in Area 2, ICs including a deed notice and the CEA/WRAs, demolition of the Edison buildings, and O&M.

The DNAPL recovery technology planned for Alternative II is continuing the passive DNAPL recovery already in place in Area 1 and passive DNAPL recovery in Area 2. The recovered DNAPL would be collected periodically and disposed of off-site. The existing Area 1 O&M procedures would be implemented as described in the existing O&M Manuals and updated as appropriate. Additional recovery wells would be installed in Area 1 if needed. In Area 2, new large-diameter DNAPL recovery wells would be installed. Following initial well placement, the DNAPL removal procedures would be optimized, and additional recovery wells installed if needed.

ICs would restrict future use of the SCCC Site, prohibit groundwater use, and include the administrative controls such as health and safety considerations regarding appropriate management of activities during intrusive work activities and personal protective equipment. Deed notices and/or other ICs to prohibit and limit potential future uses of the SCCC Site would be recorded in the Hudson County Registrar's office. In addition, the CEA/WRAs would be reviewed and updated as necessary. A groundwater monitoring plan would be developed and implemented as part of O&M.

Demolition of the existing Edison buildings would be completed as part of this alternative. The building foundations would be left in place. Fill will then be added within the building footprints, as necessary, to bring the surface to grade. Non-hazardous debris resulting from the building demolition would be consolidated within the building footprint to the extent practical. The final surface would be graded to promote positive stormwater drainage.

Alternative III: TARGETED CAP/COVER, AREA 1 CONTINUED DNAPL RECOVERY IN AREA 1, BARRIER WALL SYSTEM, DNAPL RECOVERY IN AREA 2, INSTITUTIONAL CONTROLS, AND BUILDING DEMOLITION

Capital Cost	$4,618,000
Annual O&M Cost	$396,000
Present Worth Cost	$11,246,000
Construction Time	6 months

Alternative III would include placement of targeted cap/cover in specific locations within Area 1 that are not capped/covered, including stone and vegetative cover areas and wetlands areas. The existing stone cover areas would be overlain by a more permanent cover such as asphalt paving. This alternative would also include repairing the existing covers (i.e., repairing the asphalt) as necessary. Stormwater management enhancements would be incorporated into the remedial design. Alternative III would include the same DNAPL recovery in Area 1 and Area 2, ICs, demolition of the Edison buildings, and O&M as described in Alternative II.

The detailed specifications for Alternative III would be developed during remedial design. The conceptual locations for the new DNAPL recovery wells and the conceptual targeted cap/cover system details are shown on Figure 4. The stone covered and vegetated areas are assumed to be covered with an asphalt cover system consisting of two inches of wearing course, two inches of asphalt binder course, four inches of granular subgrade, and capillary break as necessary. The proposed cap/cover systems would be retrofitted into the existing cap/cover systems. Low lying areas of the existing asphalt or areas observed to be in disrepair would be lined with additional asphalt to facilitate positive stormwater drainage and reduce infiltration. The wetlands areas would be covered with a geomembrane cap consisting of a 10 ounce per square yard (oz/sy) geotextile, a 60-mil capillary break geomembrane (or other capillary break component as needed), a 10 oz/sy geotextile, and one foot of wetlands planting substrate and revegetation. Proposed topsoil composition, planned plant species, and post-restoration monitoring requirements would be determined during the remedial design. The wetlands planting substrate is assumed to consist of a silty organic soil followed by wetlands plants; the list of plants would be determined during the design phase and likely would be consistent with existing restoration efforts for freshwater emergent wetlands which included the planting of salt meadow cordgrass, spike grass, prairie cord grass, black grass, swamp mallow, big cordgrass, seaside goldenrod, salt marsh bulrush, switch grass, and groundsel bush. It is assumed that the seed mixture to establish first year coverage would consist of annual rye, fall panicum, switch grass, coastal panic grass, and lady's thumb. A freshwater emergent wetlands restoration monitoring plan would be prepared as part of the remedial design. The plan would include invasive species management, post-construction monitoring (growing seasons one and two), specifications, and a final wetlands monitoring report.

Alternative IV: SITE WIDE ENGINEERED CAP/COVER, CONTINUED DNAPL RECOVERY IN AREA 1, BARRIER WALL SYSTEM, DNAPL RECOVERY IN AREA 2, INSTITUTIONAL CONTROLS, AND BUILDING DEMOLITION

Capital Cost	$13,456,000
Annual O&M Cost	$231,000
Present Worth Cost	$17,299,000
Construction Time	12 months

Alternative IV would include a new engineered cap/cover system on the SCCC property for all but the Consolidation Area, which already has a geosynthetic liner overlain by a vegetative cover, and a wetland area cap/cover (or relocation and

restoration). The capillary break cap/cover components and the stormwater management enhancements associated with Alternative III would be installed as part of Alternative IV. Alternative IV also would include the same DNAPL recovery in Area 1 and Area 2, ICs, demolition of the Edison buildings, and O&M as described in Alternative II.

The detailed specifications for Alternative IV would be developed during remedial design. Because the engineered cap/cover would encompass essentially the entire SCCC property (with the exception of the Consolidation Area and the wetlands areas), no repair of the existing covers would be necessary. The engineered cap/cover would extend over the prepared surface of the Edison building footprints. For conceptual planning and cost estimating, the SCCC property areas are assumed to be covered with an engineered cap/cover system consisting of a 10 oz/sy non-woven geotextile layer, a 60-mil geomembrane, another 10 oz/sy non-woven geotextile layer, approximately 33 inches of general fill (including a capillary break as needed), approximately three inches of topsoil, and seeding and mulching of the topsoil. The existing wetlands on-site that would be capped/covered include freshwater emergent wetlands that were formed as a result of stormwater runoff. The proposed Alternative IV cap/cover to be installed in the freshwater emergent and isolated wetlands would be the same as that for the wetlands cover in Alternative III. Based on the conceptual scenario provided for Alternative IV, the current hydrology would be minimally affected. There would be an increase in stormwater runoff draining to the wetlands due to the cap/cover improvements and increase in SCCC Site grades. The change in elevation of the wetlands would be consistent with the overall change in elevation of the SCCC Site, however, and the drainage area would be unchanged and therefore it is expected that the proposed cap/cover would not greatly affect the hydrology of the wetlands. In addition, the existing catch basins and stormwater structures would be modified to accommodate the addition of the cap/cover fill materials. Also, this alternative would include the option to relocate existing non-permitted pre-IRA wetlands to other areas on the SCCC Site or to utilize the wetland banking option and purchase wetland credits off-site. If the existing wetlands are relocated on the SCCC Site, the relocation area would compensate for the loss of the existing wetlands. The relocated wetlands would be constructed in the same manner as the cap/cover installation methods in the freshwater emergent wetlands described in Alternative III and their location and areal extent would be determined during the remedial design.

Alternatives II, III, and IV would result in contaminants remaining on the site above levels that would allow for unlimited use and unrestricted exposure. Therefore, a review of the SCCC Site conditions would be conducted by EPA at least once every five years, as required by CERCLA.

Comparative Analysis of Alternatives

This section includes a comparative analysis of the four alternatives developed for Area 1 and Area 2. Each alternative is compared relative to seven of the nine NCP criteria, with the remaining two (community acceptance and state acceptance) to be addressed in the ROD following the public comment period.

Overall Protection of Human Health and the Environment

Alternative I would not provide overall protection of human health and the environment. This no-action alternative does not prevent or eliminate human exposure and does not reduce the mass of site-related DNAPL, and so Alternative I would not address the RAOs for the site. Alternatives II, III, and IV would offer protection of human health and the environment.

The placement of additional cap/cover systems (Alternatives III and IV) would provide additional overall protection to human health and the environment due to the further reduction in exposure and reduction in transport of impacted soil. The additional protection is considered similar for both Alternatives III and IV. The release or threat of release of asbestos and lead into the environment would be addressed in Alternatives II, III, and IV via demolition of the dilapidated Edison buildings.

Compliance with ARARs

The chemical-specific ARARs for all the alternatives include groundwater quality standards and soil standards. Drinking water standards (MCLs) would be waived in Area 1 and Area 2 due to the technical impracticability of attaining those standards in groundwater under all alternatives. Alternatives II, III, and IV would comply with chemical-specific soil ARARs through ICs and cap/covers.

Location-specific ARARs include requirements for floodplains and wetlands areas. Alternative I would not comply with these ARARs. Alternatives II, III, and IV would comply with the location-specific ARARs including potential excavation and filling activities in wetland or floodplain areas.

No action-specific ARARs pertain to Alternative I, which is the no action alternative. Action-specific ARARs for Alternatives II, III, and IV include erosion and sedimentation control/ stormwater management regulations and hazardous and solid waste management regulations. Alternatives II, III, and IV would comply with action-specific ARARs.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

1. Overall Protection of Human Health and the Environment evaluates whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contaminant present.

5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. *Implementability* considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. *Cost* includes estimated capital and annual operation and maintenance costs, as well as present-worth cost. Present-worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. *State Acceptance* considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. *Community Acceptance* considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

In sum, Alternative I does not meet the threshold criterion of overall protection of human health and the environment. Accordingly, it is not considered further in assessing the five balancing criteria in the comparative analysis. Alternatives III and IV offer greater overall protection of human health and the environment than Alternative II. Alternatives II, III, and IV are considered equivalent with respect to the threshold criterion of compliance with ARARs.

Long-Term Effectiveness and Permanence

Alternatives II, III, and IV are each anticipated to have both long-term effectiveness and permanence, as all three alternatives include monitoring and maintenance to ensure that the remedies remain protective.

Reduction of Toxicity, Mobility, or Volume

The reduction of toxicity and volume of COPCs in impacted media would continue for Alternatives II, III, and IV by virtue of the continued O&M of the hydraulic control and treatment system. The additional cap/cover areas (Alternatives III and IV) would further reduce the infiltration of stormwater and the volume of impacted groundwater and provide enhanced direct contact protection. Alternative IV provides a slightly better reduction in infiltration due to the installation of a geomembrane that provides slightly improved reduction in mobility and volume.

Short-Term Effectiveness

The construction activities associated with Alternatives II, III, and IV would generally be surficial with the exception of the Area 2 DNAPL well drilling/installation, and only relatively small quantities of impacted SCCC Site media would need to be managed during the active construction. Therefore, the short-term human risks resulting from these actions are considered to be minimal.

The potential short-term risks for Alternative IV would be greater than Alternatives II and III due to the larger volumes of fill soil to be transported and placed and the longer duration of construction activities.

The estimated timeframe is approximately three months to complete Alternative II. The estimated timeframes are approximately six months to construct Alternative III, and approximately one year to complete construction of Alternative IV. The sequentially longer timeframes are due to more extensive construction requirements. These construction schedules are within typical and expected remedial construction timeframes.

Implementability

The technical and administrative issues increase progressively for Alternatives II, III, and IV. However, the cap/cover alternatives have commonly been utilized at similar sites, including previously at the SCCC Site. Implementation of Alternatives II, III, and IV would require specialized contractors and equipment which are readily available. The clearing and grubbing requirements would be most significant for Alternative IV versus Alternative III, however, the difference is not significant. Management of impacted media and DNAPL required for Alternatives II, III, and IV is readily implementable. Alternatives II, III, and IV are considered to be equivalent with respect to implementability.

Alternative	Capital Cost	Annual O&M	Total Present Worth Cost
I	$ 0	$ 0	$ 0
II	$ 1,392,000	$ 541,000	$ 9,759,000
III	$ 4,618,000	$ 396,000	$11,246,000
IV	$13,456,000	$ 231,000	$17,299,000

Cost

A summary of the total estimated cost for each remedial alternative is provided in this section for comparative analysis. The total estimated present worth costs (including the applicable capital and O&M costs) range from $0 for Alternative I to $17,299,000 for Alternative IV as shown in the table above.

Total estimated present worth costs for Alternative II and Alternative III are somewhat similar, with Alternative III being more expensive than Alternative II. The estimated capital cost of Alternative IV is substantially higher than the capital costs of Alternatives II and III.

State Acceptance

NJDEP is reviewing the proposed remedy.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the Proposed Plan.

PREFERRED ALTERNATIVE

EPA's preferred alternative is Alternative III: TARGETED CAP/COVER, CONTINUED DNAPL RECOVERY IN AREA 1, BARRIER WALL SYSTEM, DNAPL RECOVERY IN AREA 2, INSTITUTIONAL CONTROLS, AND BUILDING DEMOLITION.

EPA is identifying Alternative III as the preferred alternative because it satisfies the two threshold criteria (protection of human health and the environment and compliance with ARARs) and provides the best balance of tradeoffs among the other alternatives with respect to the five balancing criteria (short-term effectiveness; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; implementability; and cost). The major components of the preferred alternative are as follows:

- placement of targeted cap/cover in specific locations within Area 1 that are not capped/covered, including stone and vegetative cover areas and wetlands areas. The existing stone cover areas would be overlain by a more permanent cover such as asphalt paving. This alternative would also include repairing the existing covers (e.g., repairing the asphalt) as necessary. Stormwater management enhancements would be incorporated into the remedial design;
- DNAPL recovery in Area 1 and Area 2;
- ICs in the form of deed notices, CEA/WRAs or other ICs to restrict future use of the SCCC Site to commercial/industrial uses and prohibit residential use, and to prohibit groundwater use in Area 1 and Area 2;
- demolition of the Edison buildings;
- O&M; and,
- Five-Year Reviews.

Alternative III is protective of human health and the environment. This alternative addresses all of the RAOs established for the SCCC Site. The placement of additional cap/cover systems provides additional protection to human health and the environment due to the additional reduction in exposure potential and reduction in transport of impacted soil. The release or threat of release of asbestos and lead into the environment is addressed via demolition of the dilapidated Edison buildings. When practicable and cost-effective, Alternative III would be designed to accommodate the commercial/industrial redevelopment plans for Area 1, while at the same time maintaining the environmental protectiveness provided by the remedy.

Alternative III addresses the principal threat wastes of DNAPL through recovery and off-site disposal of the liquid waste and the COPR fill materials through cap/cover systems.

Based on the information currently available, EPA believes the preferred Alternative III meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the preferred Alternative III to satisfy the following statutory requirements of CERCLA Section 121(b), 42 U.S.C. § 9621(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment (via the existing groundwater treatment system) as a principal element. EPA will assess the two modifying criteria of state acceptance and community acceptance in the ROD to be issued following the close of the public comment period.

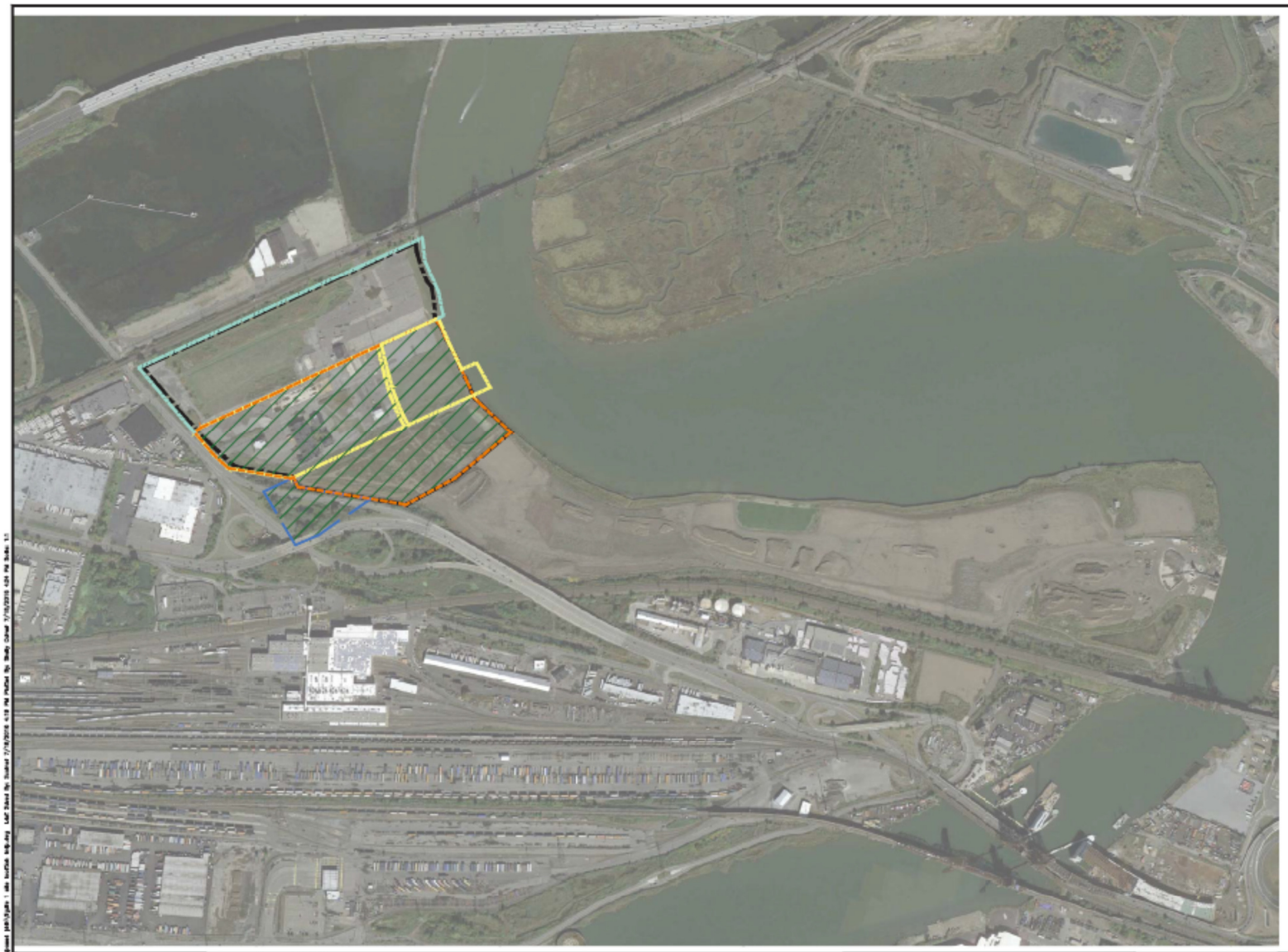
FOR FURTHER INFORMATION

The administrative record file, which contains copies of the Proposed Plan and supporting documentation, is available at the following locations:

Kearny Public Library
318 Kearny Ave
Kearny, NJ 07032
(201) 998-2666
Summer Hours: Monday, Thursday & Friday 9:30 a.m. - 6:00 p.m., Tuesday & Wednesday 9:30 a.m. - 8:00 p.m.,
Saturday and Sunday CLOSED

EPA Region 2 Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Mon – Fri, 9:00 AM-5:00 PM

In addition, select documents from the administrative record are available on-line at: https://semspub.epa.gov/src/collection/02/AR63968



N

LEGEND

- SCCC SITE PROPERTY BOUNDARY
- DIAMOND SITE PROPERTY BOUNDARY
- AREA 1 LIMITS
- AREA 2 LIMITS
- SCCC SITE AREA
- SLURRY WALL

0 700 1400 FEET

REV #	DATE	DESCRIPTION	APPD
0			
1			
2			

REFERENCE:
1. PROPERTY BOUNDARY SHOWN HEREON FROM SHEET 1 OF 1 TITLED SURVEY OF PROPERTY, TAX LOTS 23.03, 46, 47 & 47R, BLOCK 267, TAX LOTS 48, 49, 50, 51, 52 AND 52R, BLOCK 267, TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY," DATED JULY 1, 2009 (REVISION 2: JULY 28, 2009), PREPARED BY DIVISTA ASSOCIATES, PC.
2. IMAGE PROVIDED BY GOOGLE EARTH DATED OCTOBER, 2015.

ISSUE DATE:

KEY ENVIRONMENTAL, INC.
200 THIRD AVENUE
CARNEGIE, PA 15106

PERFORMING PARTIES GROUP

DRWN: SGC	DATE: 06/15/16
CHKD:	DATE:
APPD:	DATE:
SCALE:	AS SHOWN

PROPOSED PLAN
STANDARD CHLORINE CHEMICAL CO., INC. SITE
KEARNY, HUDSON COUNTY, NEW JERSEY

SITE LOCATION MAP

PROJECT NO. 201201-02

FIGURE 1

LEGEND

- PROPERTY BOUNDARY
- EXISTING GROUND SURFACE ELEVATION
- RIVER/CHANNEL
- SURFACE COVER IRM COMPRISED OF ASPHALTIC CONCRETE
- SURFACE COVER IRM COMPRISED OF SOIL
- SURFACE COVER IRM COMPRISED OF GEOMEMBRANE OVERLAIN WITH AGGREGRATE
- EAST AND WEST LAGOONS
- SOUTH DITCH
- WETLANDS
- BUILDING
- INTERNAL ACCESS ROUTES
- BLOCK AND LOT LINE

REFERENCE:
1. EXISTING GROUND SURFACE CONTOURS PER AIR SURVEY, DULLES, VIRGINIA, APRIL 14, 2001. HORIZONTAL REFERENCE: NEW JERSEY STATE PLANE COORDINATES (NAD 1927). VERTICAL REFERENCE:NATIONAL GEODETIC VERTICAL DATUM (NGVD 1929).
2. PROPERTY BOUNDARY SHOWN HEREON FROM SHEET 1 OF 1 TITLED "SURVEY OF PROPERTY, TAX LOTS 32.03, 46, 47 & 47R, BLOCK 287, TAX LOTS 48, 49, 50, 51, 52 AND 52R, BLOCK 287, TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY," DATED JULY 1, 2009 (REVISION 2: JULY 29, 2009), PREPARED BY DVIRKA ASSOCIATES, PC.
3. EXISTING WETLANDS PER WETLAND DELINEATION BY PERKERSON RYDER, LLC FOR KEY ENVIRONMENTAL, INC. PERFORMED IN MARCH 2008.

REV #	DATE	DESCRIPTION	APPD
1			
2			
3			

ISSUE DATE:

KEY ENVIRONMENTAL, INC.
300 TWIN AVENUE
CARNEGIE, PA 15106

PERFORMING PARTIES GROUP

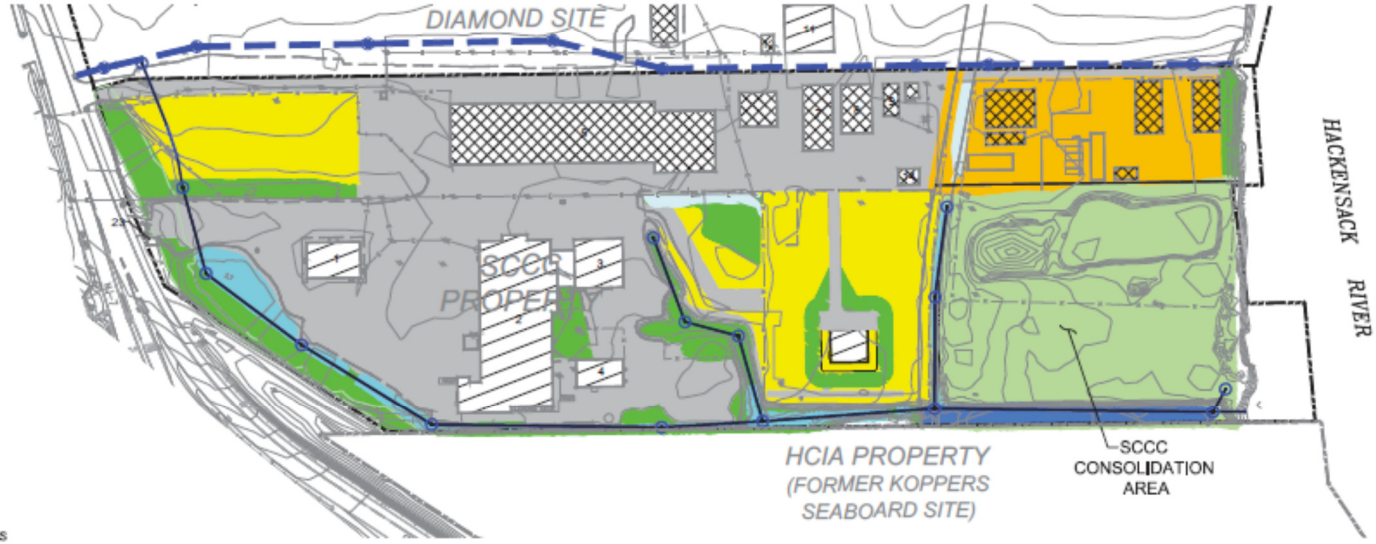
DRWN: SCC	DATE: 05/24/18	KEY ENVIRONMENTAL INCORPORATED
CHKD:	DATE:	
APPD:	DATE:	
SCALE: AS SHOWN		

PROPOSED PLAN
STANDARD CHLORINE CHEMICAL CO., INC. SITE
KEARNY, HUDSON COUNTY, NEW JERSEY

HISTORICAL SITE ARRANGEMENT

PROJECT NO: 301501-05

FIGURE 2



LEGEND

- EXISTING ACCESS ROAD
- EXISTING NEW JERSEY TRANSIT RAILROAD (ACTIVE)
- EXISTING FENCE
- EXISTING STRUCTURES
- EXISTING UTILITY POLES
- EXISTING LIGHT STANDARD
- EXISTING OVERHEAD POWER LINE
- PROPERTY BOUNDARY
- EXISTING CONCRETE PAD
- EXISTING GROUND SURFACE ELEVATION CONTOURS
- EXISTING VEGETATION
- EXISTING STREAM, POND AND RIVER BANK
- EXISTING ELEVATION (FEET–MSL)
- EXISTING STORM DRAIN (48" PIPE)
- CULVERT(S)
- DROP INLET
- DROP INLET
- EXISTING BUILDING
- FORMER BUILDING FOUNDATION/SLAB
- WETLANDS
- NON–PERMITTED PRE–IRA WETLAND AREAS
- WETLAND UNDERLAIN BY GEOSYNTHETIC LINER
- VEGETATIVE COVER
- VEGETATIVE COVER UNDERLAIN WITH GEOSYNTHETIC LINER
- STONE COVER
- ASPHALT
- GEOMEMBRANE OVERLAIN WITH AGGREGATE

0 100 200 FEET

REV #	DATE	DESCRIPTION	APPD
2	11–07–13	LABELED BUILDING 23.	CAZ
1			
0			

REFERENCES:
1. EXISTING GROUND SURFACE CONTOURS PER AIR SURVEY, DULLES, VIRGINIA, APRIL 14, 2001. HORIZONTAL REFERENCE: NEW JERSEY STATE PLANE COORDINATES (NAD 1927). VERTICAL REFERENCE/ADDITIONAL ACCURATE VERTICAL DATUM (NGVD 1929).
2. PROPERTY BOUNDARY SHOWN HEREON FROM SHEET 1 OF 1 TITLED "SURVEY OF PROPERTY, TAX LOTS 32.02, 46, 47 & 47B, BLOCK 287; TAX LOTS 48, 49, 50, 51, 52 AND 52B, BLOCK 287, TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY," DATED JULY 1, 2009 (REVISION 2: JULY 26, 2013), PREPARED BY DIVISTA ASSOCIATES, PC.
3. EXISTING WETLANDS PER WETLAND DELINEATION BY PRINCETON HYDRO, LLC FOR KEY ENVIRONMENTAL, INC. PERFORMED IN MARCH 2008.

ISSUE DATE:

KEY ENVIRONMENTAL, INC.
300 TWIN AVENUE
CANONSIE, PA 19108

PERFORMING PARTIES GROUP

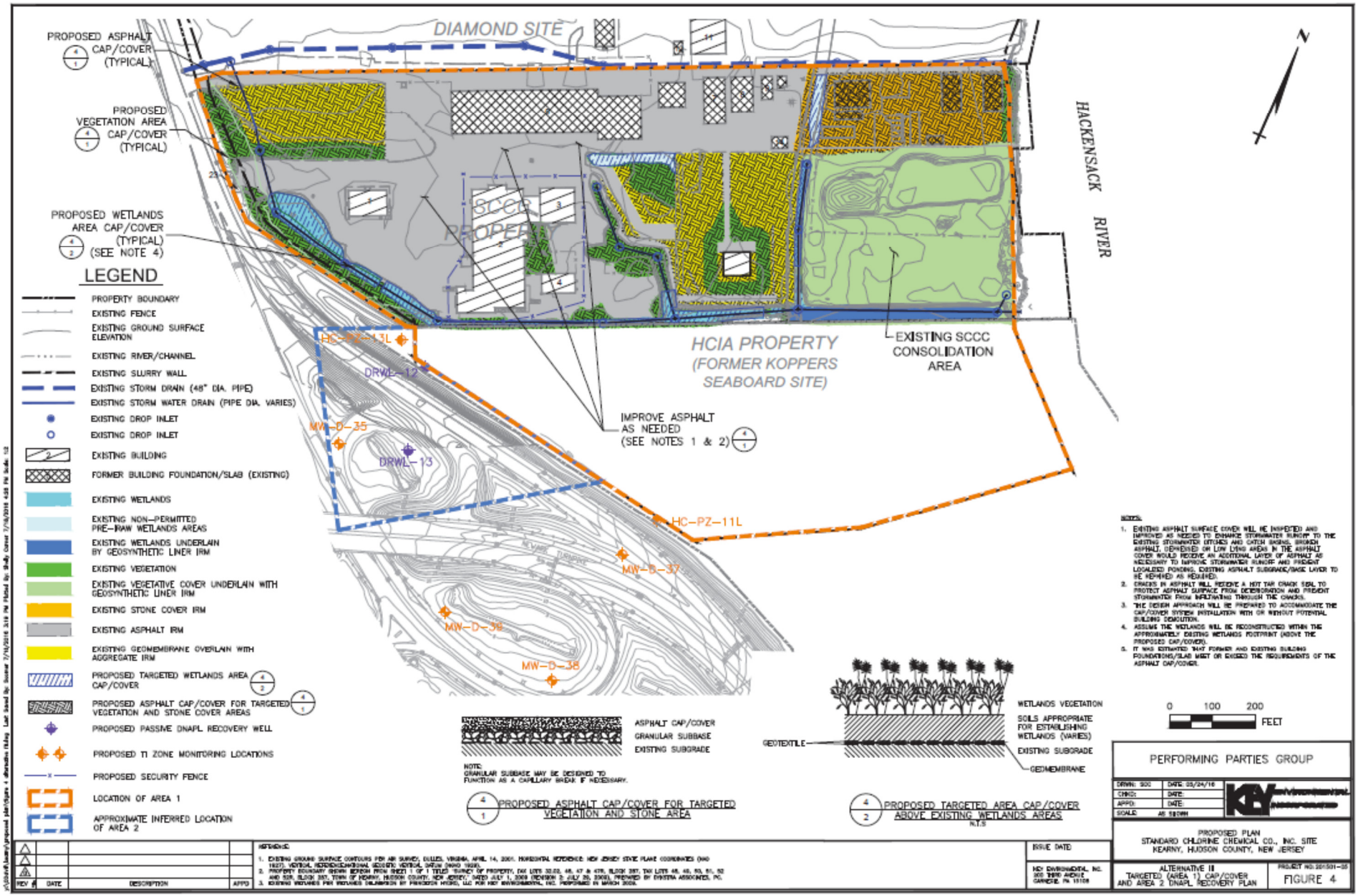
DRWN: SGC	DATE: 05/09/10
CHKD:	DATE:
APPD:	DATE:
SCALE:	AS SHOWN

PROPOSED PLAN
STANDARD CHLORINE CHEMICAL CO., INC. SITE
KEARNY, HUDSON COUNTY, NEW JERSEY

CURRENT SITE ARRANGEMENT

PROJECT NO: 201501–05

FIGURE 3


DIAMOND SITE
PROPOSED ASPHALT CAP/COVER (4/1) (TYPICAL)
PROPOSED VEGETATION AREA CAP/COVER (4/1) (TYPICAL)
PROPOSED WETLANDS AREA CAP/COVER (4/2) (TYPICAL) (SEE NOTE 4)
SCCC PROPERTY
HACKENSACK RIVER
N
HCIA PROPERTY
(FORMER KOPPERS SEABOARD SITE)
EXISTING SCCC CONSOLIDATION AREA
IMPROVE ASPHALT AS NEEDED (SEE NOTES 1 & 2) (4/1)
HC-PZ-13L
DRWL-12
MW-D-35
DRWL-13
HC-PZ-11L
MW-D-37
MW-D-36
MW-D-38
LEGEND
PROPERTY BOUNDARY
EXISTING FENCE
EXISTING GROUND SURFACE ELEVATION
EXISTING RIVER/CHANNEL
EXISTING SLURRY WALL
EXISTING STORM DRAIN (48" DIA. PIPE)
EXISTING STORM WATER DRAIN (PIPE DIA. VARIES)
EXISTING DROP INLET
EXISTING DROP INLET
EXISTING BUILDING
FORMER BUILDING FOUNDATION/SLAB (EXISTING)
EXISTING WETLANDS
EXISTING NON-PERMITTED PRE-IRAW WETLANDS AREAS
EXISTING WETLANDS UNDERLAIN BY GEOSYNTHETIC LINER IRM
EXISTING VEGETATION
EXISTING VEGETATIVE COVER UNDERLAIN WITH GEOSYNTHETIC LINER IRM
EXISTING STONE COVER IRM
EXISTING ASPHALT IRM
EXISTING GEOMEMBRANE OVERLAIN WITH AGGREGATE IRM
PROPOSED TARGETED WETLANDS AREA CAP/COVER (4/2)
PROPOSED ASPHALT CAP/COVER FOR TARGETED VEGETATION AND STONE COVER AREAS (4/1)
PROPOSED PASSIVE DNAPL RECOVERY WELL
PROPOSED TI ZONE MONITORING LOCATIONS
PROPOSED SECURITY FENCE
LOCATION OF AREA 1
APPROXIMATE INFERRED LOCATION OF AREA 2
ASPHALT CAP/COVER
GRANULAR SUBBASE
EXISTING SUBGRADE
NOTE:
GRANULAR SUBBASE MAY BE DESIGNED TO FUNCTION AS A CAPILLARY BREAK IF NECESSARY.
4/1 PROPOSED ASPHALT CAP/COVER FOR TARGETED VEGETATION AND STONE AREA
WETLANDS VEGETATION
SOILS APPROPRIATE FOR ESTABLISHING WETLANDS (VARIES)
GEOTEXTILE
EXISTING SUBGRADE
GEOMEMBRANE
4/2 PROPOSED TARGETED AREA CAP/COVER ABOVE EXISTING WETLANDS AREAS
N.T.S.
NOTES:
1. EXISTING ASPHALT SURFACE COVER WILL BE INSPECTED AND IMPROVED AS NEEDED TO ENHANCE STORMWATER RUNOFF TO THE EXISTING STORMWATER CATCHES AND CATCH BASINS. BROKEN ASPHALT, DEPRESSED OR LOW LYING AREAS IN THE ASPHALT COVER WOULD RECEIVE AN ADDITIONAL LAYER OF ASPHALT AS NECESSARY TO IMPROVE STORMWATER RUNOFF AND PREVENT LOCALIZED PONDING. EXISTING ASPHALT SUBGRADE/BASE LAYER TO BE REPAIRED AS REQUIRED.
2. CRACKS IN ASPHALT WILL RECEIVE A HOT TAR CRACK SEAL TO PROTECT ASPHALT SURFACE FROM DETERIORATION AND PREVENT STORMWATER FROM INFILTRATING THROUGH THE CRACKS.
3. THE DESIGN APPROACH WILL BE PREPARED TO ACCOMMODATE THE CAP/COVER SYSTEM INSTALLATION WITH OR WITHOUT POTENTIAL BUILDING DEMOLITION.
4. ASSUME THE WETLANDS WILL BE RECONSTRUCTED WITHIN THE APPROXIMATELY EXISTING WETLANDS FOOTPRINT (ABOVE THE PROPOSED CAP/COVER).
5. IT WAS ESTIMATED THAT FORMER AND EXISTING BUILDING FOUNDATIONS/SLAB MEET OR EXCEED THE REQUIREMENTS OF THE ASPHALT CAP/COVER.
0 100 200
FEET
PERFORMING PARTIES GROUP
DRWN: SGO DATE: 05/24/16
CHKD: DATE:
APPD: DATE:
SCALE: AS SHOWN
PROPOSED PLAN
STANDARD CHLORINE CHEMICAL CO., INC. SITE
KEARNY, HUDSON COUNTY, NEW JERSEY
ALTERNATIVE 1B
TARGETED (AREA 1) CAP/COVER AND AREA 2 DNAPL RECOVERY PLAN
PROJECT NO: 30150-35
FIGURE 4
REV # DATE DESCRIPTION APPD
REFERENCE:
1. EXISTING GROUND SURFACE CONTOURS FOR AIR SURVEY, DULLES, VIRGINIA, APRIL 14, 2001. HORIZONTAL REFERENCE: NEW JERSEY STATE PLANE COORDINATES (NAD 1927). VERTICAL REFERENCE/ADDITIONAL SECURITY VERTICAL DATUM (NAVD 1929).
2. PROPERTY BOUNDARY SHOWN HEREON FROM SHEET 1 OF 1 TITLED "SURVEY OF PROPERTY, TAX LOTS 32.02, 46, 47 & 47R, BLOCK 287, TAX LOTS 48, 49, 50, 51, 52 AND 52R, BLOCK 287, TOWN OF KEARNY, HUDSON COUNTY, NEW JERSEY," DATED JULY 1, 2009 (REVISION 2: JULY 20, 2009), PREPARED BY SYNSTRA ASSOCIATES, PC.
3. EXISTING WETLANDS PER WETLANDS DELINEATION BY PRINCETON HYDRO, LLC FOR KEY ENVIRONMENTAL, INC. PERFORMED IN MARCH 2008.
ISSUE DATE
KEY ENVIRONMENTAL, INC.
300 TWIN AVENUE
CAMDEN, PA 19108